Abstract Submitted
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Plasmon tuning via the conductivity tensor MORGAN LABALLE, MAXIM DURACH, Georgia Southern University — Metallic structures with corrugated surfaces have applications in a variety of research areas. As these structures are very important, it is essential that their properties be well understood. However, the solutions to Maxwell's Equations in corrugated structures are difficult to determine. Thus, an alternative, simpler approach to solving this structure would be very advantageous. We have developed such an approach by modeling the corrugated surface as a thin film with an optical conductivity. When light is incident upon a metal-air interface, the electromagnetic fields are able to form a surface plasmon wave that possesses a shorter wavelength than light in free space. Our model's boundary conditions allow us to describe the k-vector of the wave with the film's optical conductivity. After a thorough investigation of the dependence of the k-vector on this conductivity, we have determined that the k-vector can take values greater than or equal to zero. Those values correspond to various tuned plasmon waves. By matching one of these waves with those produced in experiments, we are able to more fully investigate the properties of corrugated metal-dielectric interfaces.

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